



*Caltrans*

# BEFORE WE START



- PLEASE SET YOUR PAGERS AND CELL PHONES ON VIBRATE
  - \* # 9 ALL
- CLASS CHARGE CODES
  - AUTHORIZATION
    - 912076
  - SPECIAL DESIGNATION
    - G0C001
  - ACTIVITY
    - 2059



# Construction Academy (AKA "Boot Camp")



# Construction Academy Curriculum



<b>Introduction</b>	Introduction, Vision, Mission, Goals
<b>Implementation</b>	Reporting Contractor's Activities Control of Materials Entering the Work Preparation of Pay Documents
<b>Interaction</b>	Human Relations Administrative Issues
<b>Investigation</b>	Environmental Issues Safety Issues



# Introductions

The background of the slide features a stylized illustration. In the center, two hands are shown in a firm handshake, rendered in shades of orange and yellow. Below the hands, a portion of a laptop keyboard is visible, with keys in light blue and grey. The entire scene is set against a solid blue background.

- Name, work location, and position
- What environmental issue have you been involved with lately?

# Environmental Issues



- Objectives
- Water Pollution Control
- Other Environmental Issues
- Archeological Site
- Summary

# Objectives



- The participant will learn:
  - How to identify environmental issues
  - Correct and Incorrect BMP Installations
  - Understand the environmental requirements, policies, and laws that pertain to Caltrans Construction activities



# Section 1: Water Pollution Control

# Glossary



- **BMP** - Best Management Practice
- **CPD** – Construction Procedure Directive
- **CSWC** – Construction Storm Water Coordinator
- **EPA** - Environmental Protection Agency
- **NPDES** - National Pollutant Discharge Elimination System
- **NRDC** -Natural Resources Defense Council
- **RWQCB** - Regional Water Quality Control Board

# Glossary



- **SAP** – Sampling and Analysis Plan
- **WPCP** - Water Pollution Control Program
- **SWMP** - Storm Water Management Plan
- **SWPPP** - Storm Water Pollution Prevention Plan
- **SWRCB** - State Water Resources Control Board
- **SWTF** - Storm Water Task Force

# Introduction



- What are the two primary factors that impact waters adjacent to construction sites?
- Visible Pollutants: Sediment, PCC, Petroleum
- Non-Visible Pollutants: Solvents, Acids, Fertilizers

# Introduction

## Construction Site Pollutants

Erosion and Sedimentation



Construction Wastes





# Introduction

- One gallon of oil has the potential to contaminate up to one million gallons of water

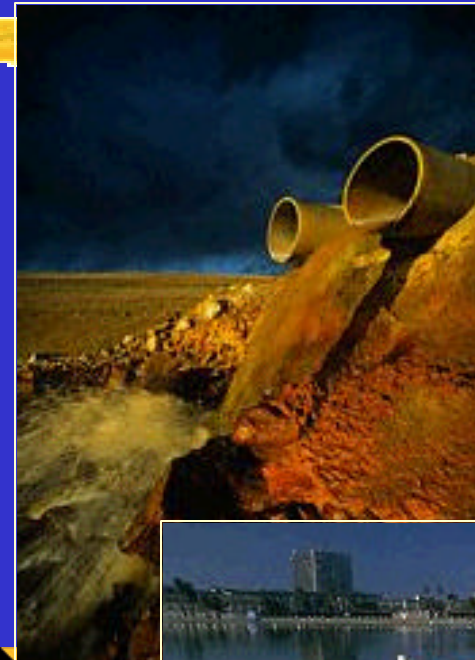
*StormWater/CleanWater protection  
program*



# Introduction

- Forty percent of all U.S. waters are not fishable or swimmable, according to the U.S. EPA
- “Even a partial accounting shows that hundreds of millions of dollars are lost each year....due to urban stormwater pollution”

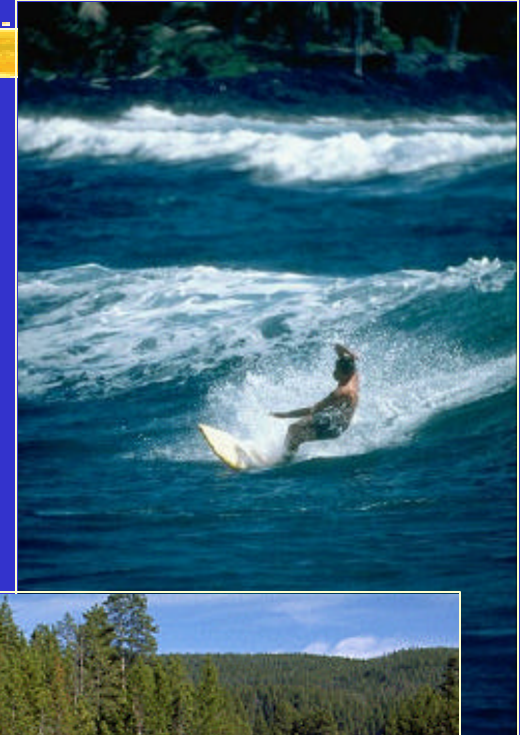
*Natural Resources Defense Council*



# Introduction

## Water Pollution Prevention

- Overall Purpose
  - To Reduce Potential Environmental and Human Health Impacts
  - Comply with State and Federal Laws





# Introduction

- Sediment, the most common pollutant washed from construction sites, clogs the gills of fish, blocks light transmission and increases ocean water temperature .....harming aquatic life, and disturbing the food chain



# Introduction

- Construction site erosion can be 10 to 1,000 times greater than nature's erosion process

*Ohio Department of Transportation*



# Introduction

## Why should we care

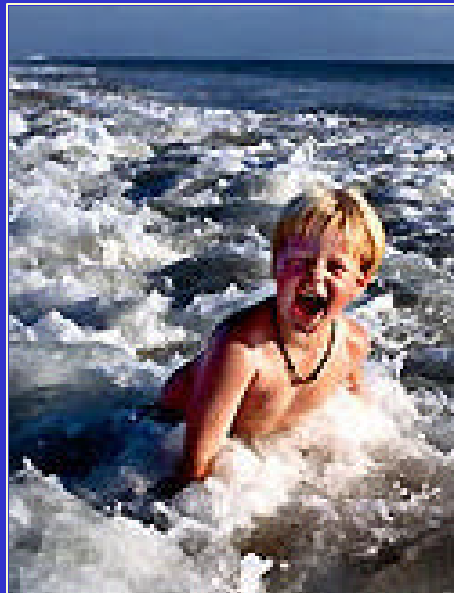
- The effects of water pollution are not only devastating to people but also to animals, fish, and birds
- Polluted water is unsuitable for drinking, recreation, agriculture, and industry. It diminishes the aesthetic quality of lakes and rivers
- Contaminated water destroys aquatic life and reduces its reproductive ability
- Nobody can escape the effects of water pollution



# Introduction

Construction Site Water Pollution Prevention helps to

- Minimize the Potential Impact that Construction Activities may have on Water Bodies and Protect their Beneficial Uses for Future Generations



# The Laws



- 1972 Federal Clean Water Act (CWA)
  - Amend to Prohibit Any Discharge of Pollutants from a Point Source, NPDES
- 1987 Amendments to the CWA
  - Added Section 402(p) Establishing the Framework for Regulations Regarding Municipal and Industrial Discharges
- 1990 EPA Published Final Regulations
  - Established Permit Requirements for Storm Water Discharges Associated with Industrial (Including Construction) Activities
- 1992 California's General Permit was Adopted
  - Established Requirements for Discharges Associated with Construction Activities
  - Revised in 1999; Modified in 2001 to Include Monitoring
  - Modified in 2002: Effective March 10, 2003 Construction Activity with Soil Disturbance of 1 Acre or More Requires Coverage
- 1999 Caltrans NPDES Permit was issued –03 Permit
- California's Porter Cologne Water Quality Control Act
- Local MS4 Permits (SWMP)
- 2005 Lake Tahoe Hydrologic Unit Permit
  - = 1 acres of soil disturbance



# The Laws



- General Construction Permit CAS000002 - The '02 permit
  - Caltrans NPDES Permit CAS000003 - The '03 permit
- 
- The 02 Permit was amended in 2001 to include water quality monitoring
  - The 03 Permit requires that Caltrans' construction program complies with the General Construction Activity Permit for construction sites that disturb (1) acre or more
  - Both permits can be viewed and downloaded from the State Water Resources Control Board website, [www.swrcb.ca.gov](http://www.swrcb.ca.gov)

# The Law



- Discharge of polluted storm water, into waters of the U.S. is prohibited
- The National Pollutant Discharge Elimination System (NPDES) permit regulate discharges to waters of the U.S.

# The Law



- Coverage under General Permit is obtained by filing a Notification of Construction (NOC) with SWRCB
  - NOC must be submitted at least 30 days prior to construction
  - Should be provided in RE pending file
    - If not, RE must submit

# Who Enforces These Laws?

- EPA
- SWRCB / RWQCB
- Other Agencies
- **Private Citizens**
  - NRDC
  - Baykeepers
  - Other Watchdog
  - Groups



# What If We Don't Comply?

- Fines to \$32,500 Per Day – Per CWA
- Fines to \$15,000 Per Day and \$20 a gallon – Per Porter Cologne Act
- Current Regulatory Atmosphere
  - Violators will be held accountable



# Violation and Order for Compliance

## 1998 District 7

- “...excessive amounts of sediment to the storm drain...”
- “...discharge of false work and miscellaneous construction debris to ...Creek and ... River.”
- “ A sheen of fuel floating on the storm water ... 40 feet from a drain inlet.”



# Violation and Order for Compliance


## 2000 Home Builder...Redding

- “No effective erosion control and minimal sediment control measures....”
- Notes:
  - EPA visited the site in 1998 and 1999
  - RWQCB issued two prior violation notices that went unheeded





# Violation and Civil Liability 2002 District 3

- 
- “...one day...discharge of waste material and/or fill material within the 100-year floodplain of a surface water...”
  - “...fifteen days of failure to implement soil stabilization measures identified in the SWPPP...”
  - “...one day of failure to adequately winterize site prior to...precipitation...”
  - “...seven days of ...failing to winterize the project area...”
  - “...four days of continued earth-disturbing activities beyond the expiration of the grading deadline...”



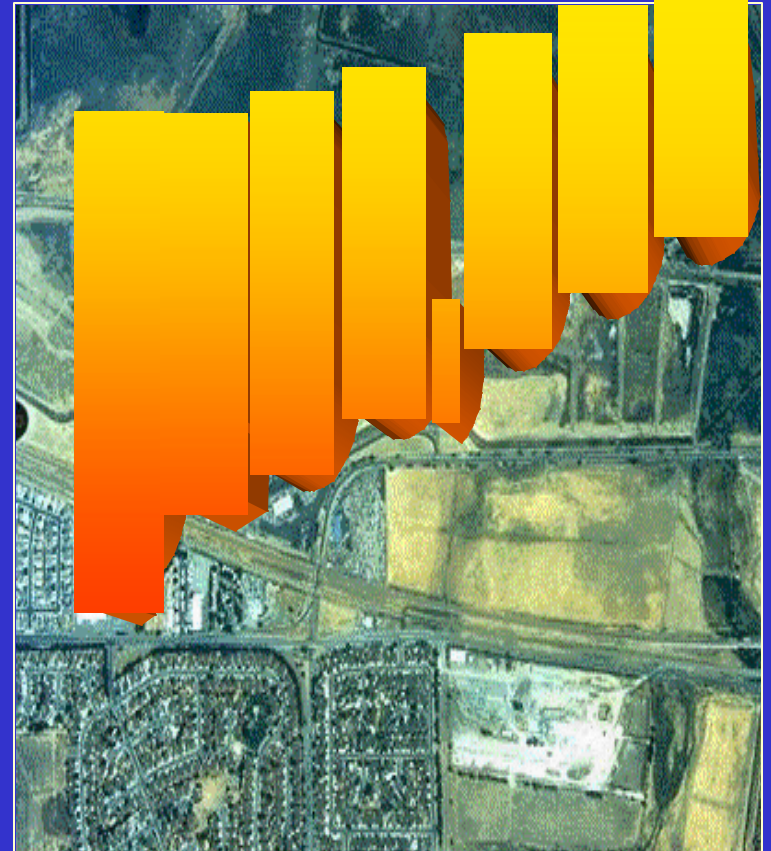
# Violation and Civil Liability 2002 District 3

- "...one day...discharge of waste material and/or fill material within the 100-year floodplain of a surface water body..."
- "...failing to implement erosion control measures identified in the permit..."
- "...continuing to inadequately winterize the project..."
- "...seven days of ...failing to winterize the project..."
- "...four days of continued earth-disturbing activity after expiration of the grading deadline..."



# Violation and Order for Compliance 2001 Home Builder...Central Valley

- No SWPPP
- Non-compliance for two years
- Discharge to a sensitive habitat



# Violation and Order for Compliance

## 1998 District 11

- “..sloppy runoff-control practices at Caltrans construction sites, drainage facilities and maintenance yards”

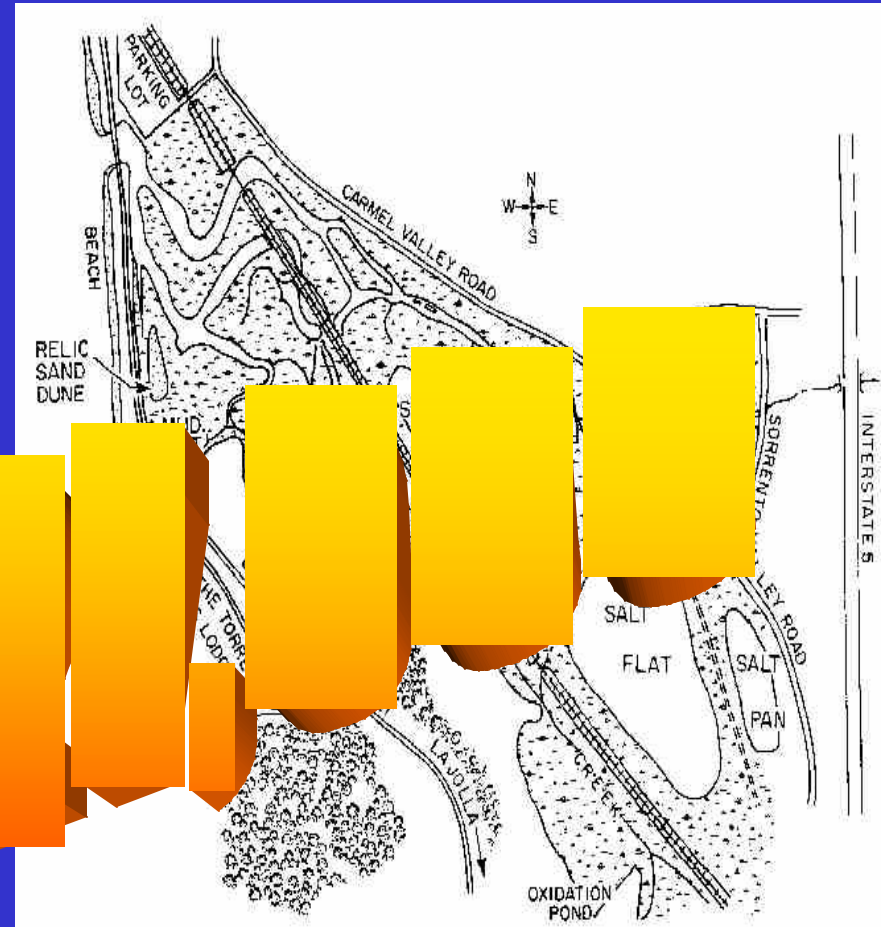
*San Diego Baykeeper*



# Violation and Order for Compliance

## 2000 City of San Diego

- “Failing to curb erosion along a dirt road above the Los Penasquitos Lagoon”



# Specifications



- **Caltrans Standard Specifications, Section 7-1.01G**
  - Requires contractors to prepare and implement a program to control water pollution effectively during the construction of all projects.
  - SWPPP/WPCP and BMPs must meet requirements of this section
- **Sections 7, 10, 16, 18, 20, and 42**

# Background

ENV 1-7 ENV 8 - 15

- Caltrans Water Pollution Control Program is comprised of two separate but equally important programs.
  - WPCP: Water Pollution Control Program
  - SWPPP: Storm Water Pollution Prevention Plans

# WPCP



- **W** - Water
- **P** - Pollution
- **C** - Control
- **P** - Program
- Construction sites:  
< 1 acre (0.4 ha)
- Shall conform to the requirements of the Caltrans “SWPPP and WPCP Preparation Manual”



# WPCP



## Requirements:

- WPCP must:

- identify pollutant sources that may affect the quality of storm water discharges from the construction site
- commit to implementing measures to reduce pollutants during and after construction is completed



# WPCP

SS 7-1.01G SSP 07-340




## Requirements

- Caltrans requires preparation and implementation by the Contractor
- Prior to starting work, Contractor must prepare for construction sites:
  - < 1 acre (0.4 ha): WPCP **SSP 07-340**

# SWPPP

ENV 1-7 ENV 8 - 15

- 
- **S** - Storm
  - **W** - Water
  - **P** - Pollution
  - **P** - Prevention
  - **P** - Plan
  - Construction sites:  
 $\geq 1$  acre (0.4 ha)
  - Required by law and  
directly regulated by  
both NPDES permits

# SWPPP



## Requirements

- SWPPP must:
  - identify pollutant sources that may affect the quality of storm discharges from the construction site
  - commit to implementing measures to reduce pollutants during and after construction is completed

# SWPPP

SS 7-1.01G SSP 07-345

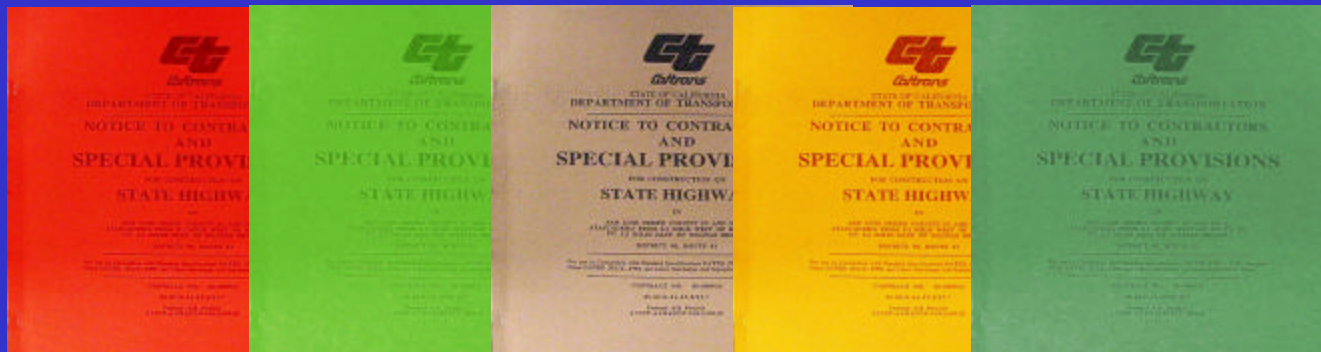
## Requirements

- Caltrans requires preparation and implementation by the Contractor
- Prior to starting work, Contractor must prepare for construction sites:
  - > 1 acre (0.4 ha): SWPPP **SSP 07-345**

# Contract Special Provisions

## ● Contract Special Provisions - Section 10

- Requires compliance with the NPDES Permit requirements
- Requires the use of Caltrans Storm Water Quality Handbooks
- Defines water pollution control requirements



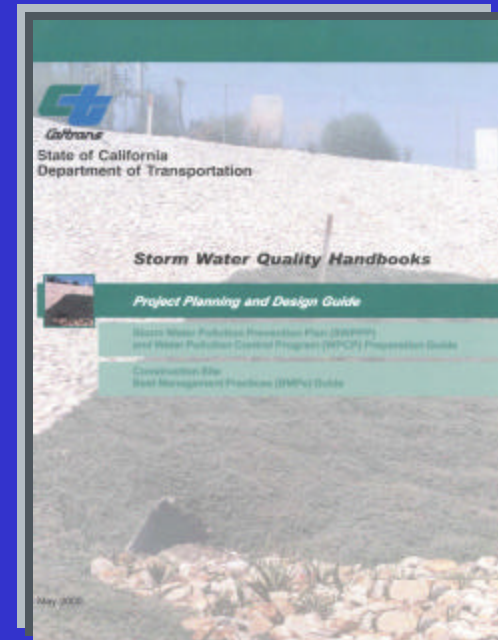
# Manuals



- Caltrans Storm Water Quality Handbooks
  - Project Planning and Design Guide
  - SWPPP / WPCP Preparation Manual
  - Construction Site BMPs Manual
    - Get Manuals online at <http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm> or hard copies are available from Caltrans Publications
- Construction Manual
- Construction Site BMP Field Manual and Troubleshooting Guide
- Dewatering Guide
- Guidance for Temporary Soil Stabilization

# Manuals

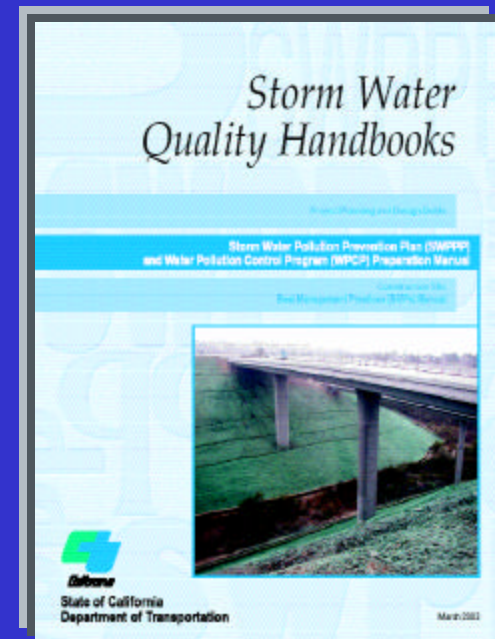
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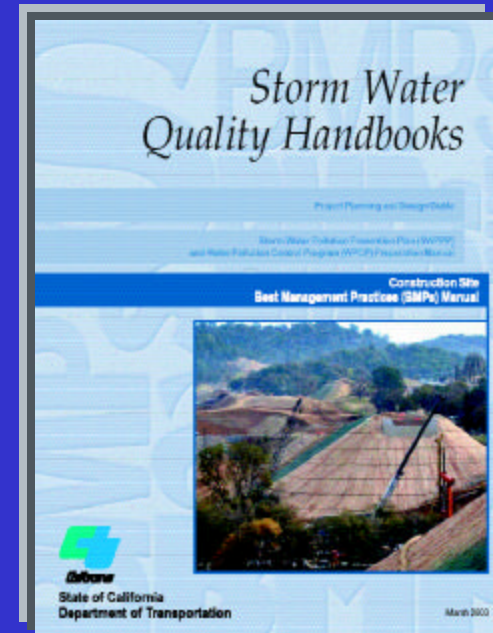
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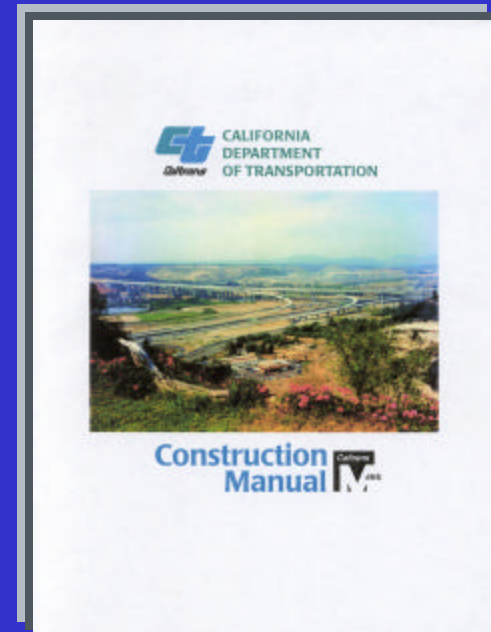
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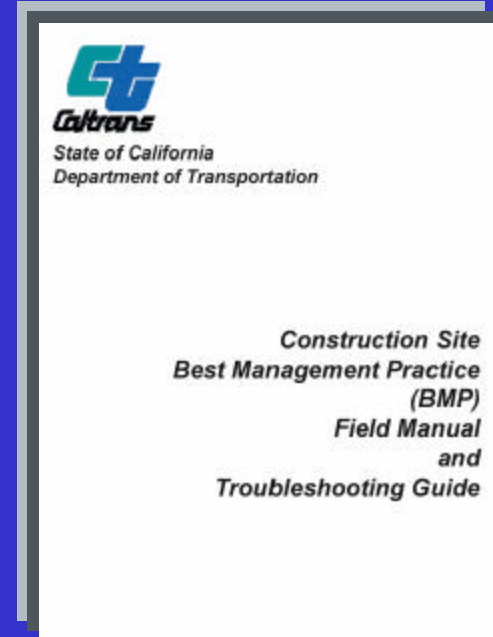
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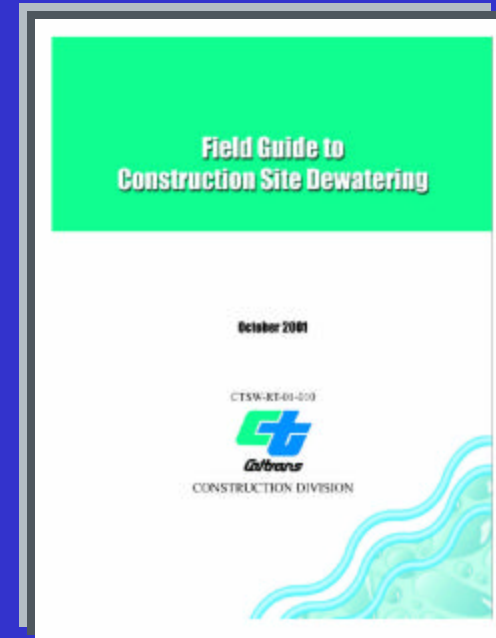
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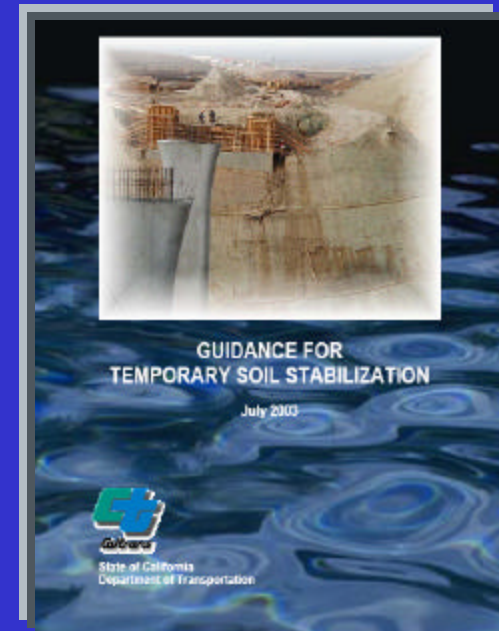
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# Construction Site Best Management Practices - BMPs

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## Objectives:

- ☒ Promote Good Housekeeping
- ☒ Contain Waste
- ☒ Minimize Disturbed Areas
- ☒ Stabilize Disturbed Areas



# Construction Site Best Management Practices - BMPs



## Objectives:

- ☒ Protect Slopes and Channels
- ☒ Control Site Perimeter
- ☒ Control Internal Erosion

# Construction Site Best Management Practices - BMPs

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- BMP defined – a technique, measure or structural control that is used for a given set of conditions to manage the quantity and improve the quality of storm water runoff in the most cost-effective manner
- Sometimes referred to as temporary control practices

# BMP Installation



## **BMP Categories**

- Temporary Soil Stabilization
- Temporary Sediment Control
- Wind Erosion Control
- Tracking Control
- Non-Storm Water Management
- Waste Management and Materials Pollution Control

# Temporary Soil Stabilization



ID	BMP Name
SS-1	Scheduling
SS-2	Preservation of Existing Vegetation
SS-3	Hydraulic Mulch
SS-4	Hydroseeding
SS-5	Soil Binders
SS-6	Straw Mulch

# Temporary Soil Stabilization



<b>ID</b>	<b>BMP Name</b>
SS-7	Geotextiles, Plastic Covers, & Erosion Control Blankets/Mats
SS-8	Wood Mulching
SS-9	Earth Dikes/Drainage Swales & Lined Ditches
SS-10	Outlet Protection/Velocity Dissipation Devices
SS-11	Slope Drains
SS-12	Streambank Stabilization

**WATER POLLUTION CONTROL IMPLEMENTATION SCHEDULE**

ID	Task Name	Duration	December	January	February	March	April	May	June	July	August	September	October	November	December
1	Rainy Season (2000-2001)	75d													
2	Rainy Season (2001-2002)	56d													
3	SWPPP Approved	1d													
4	Project Start Date	1d													
5	Mobilization	10d													
6	Construct Material/Waste Storage Facilities	10d													
7	Construct Stabilized Access	10d													
8	Add Temporary Lane in Median (Sta 400 - 900)	37d													
9	Median K-Rail	1d													
10	Install/Maintain Temporary Sediment Controls	35d													
11	Install/Maintain Temporary Soil Stabilization	23d													
12	Demolish Median	5d													
13	PCC Sawcutting	5d													
14	Non-storm water BMPs for Sawcutting	5d													
15	Median Grading	20d													
16	Median Base/ AC Paving	10d													
17	Restripe Mainline, Remove K-Rail	2d													
18	Lane Addition (Sta 500-800)	120d													
19	K-Rail and Traffic Control	2d													
20	Install/Maintain Temporary Sediment Controls	118d													
21	Clearing/Crushing	16d													
22	Demolition	15d													
23	PCC Sawcutting	18d													
24	Non-storm water BMPs for Sawcutting	10d													
25	Grading	73d													
26	Drainage	41d													
27	Install/Maintain Temporary Erosion Mitigation	80d													
28	Sewer Vault Construction	36d													
29	Base	15d													
30	PCC Paving	16d													
31	Permanent Erosion Control/Landscaping	11d													
32	Restripe Mainline, Restore K-Rail	5d													
33	Remove Temporary Median Lane	39d													
34	K-Rail and Traffic Control	2d													
35	Install/Maintain Temporary Sediment Controls	27d													
36	Demolition	10d		</											

# BMP Installation - Soil Stabilization

## SS-3 Hydraulic Mulch



Hydraulically applied paper mulch

### Caltrans Requirements

- Mulch must be approved by RE or CSWC
- Prior to application, roughen embankment and fill areas
- Hydraulic matrices need 24 hours to dry before rainfall occurs to be effective unless approved by the RE
- Application rates per SS-3



# BMP Installation - Soil Stabilization

## SS-4 Hydroseeding



### Caltrans Requirements

- Seed mix must comply with the Standard Specifications and Special Provisions
- Hydroseeding mixture requires approval by the Landscape Architect and CSWC
- Prior to application, roughen embankment and fill areas
- Steep slopes are difficult to protect with temporary seeding

Hydroseeded slopes show vegetation growth

# BMP Installation - Soil Stabilization

## SS-4 Hydroseeding

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Unstabilized slope vs. Stabilized slope

# BMP Installation - Soil Stabilization

## SS-5 Soil Binders



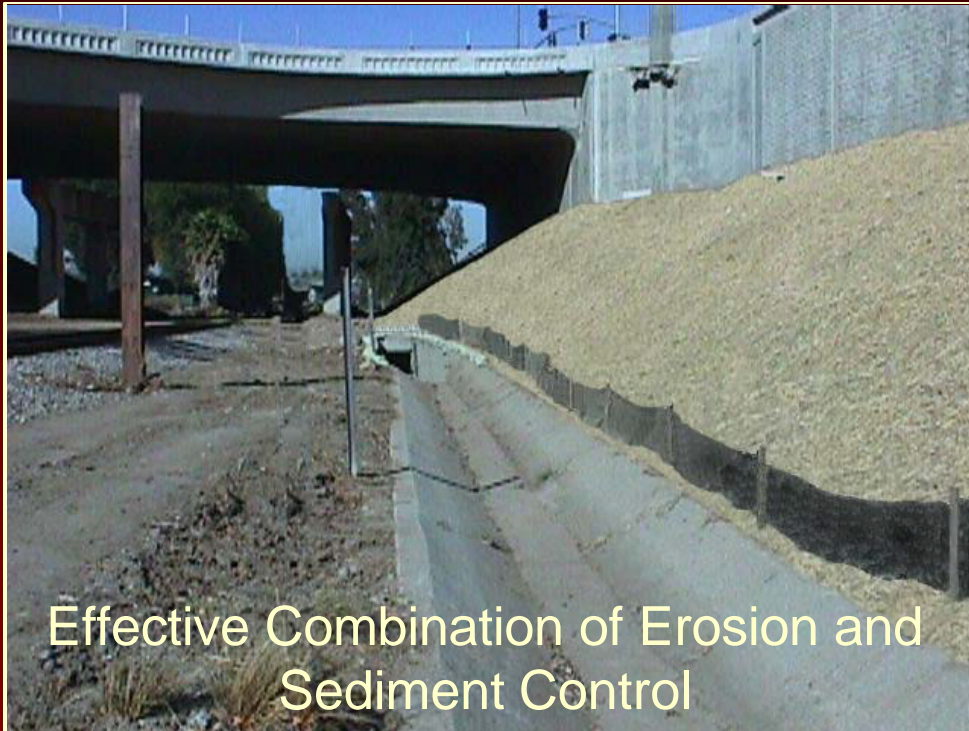
Application of Soil Binder

### Caltrans Requirements

- Are temporary and may require reapplication
- Soil type will dictate which kind of soil binder to use
- Must be environmentally benign, and shall not stain paved or painted surfaces
  - Do not apply during or immediately before a rainfall
- Application rates per SS-5

# BMP Installation - Soil Stabilization

## SS-6 Straw Mulch



### Caltrans Requirements

- Apply straw at a minimum of 2 tons per acre or as per Special Provisions
- A tackifier (glue) is the preferred method of anchoring straw
- Straw needs to last long enough to achieve erosion control objectives



# BMP Installation – Soil Stabilization

## SS-9 Earth Dikes/Drainage Swales/Lined Ditches



### Caltrans Requirements

- Conveyances shall be stabilized
- Not suitable for trapping sediment
- Do not divert runoff onto other property

# Temporary Sediment Control



ID	BMP Name
SC-1	Silt Fence
SC-2	Sediment / Desilting Basin
SC-3	Sediment Trap
SC-4	Check Dam
SC-5	Fiber Rolls
SC-6	Gravel Bag Berm
SC-7	Street Sweeping and Vacuuming
SC-8	Sandbag Barrier
SC-9	Straw Bale Barrier
SC-10	Storm Drain Inlet Protection

# BMP Installation - Sediment Controls

## SC-1 Silt Fence



Incorrect installation of silt fence, bottom portion not properly keyed in.

### Caltrans Requirements

- Not effective unless keyed in
  - Locate on level contours
- Use along the perimeter of a project
- Don't use in streams, channels or anywhere flow is concentrated
  - Locate in areas suitable for ponding and sediment deposition
- Maintain to provide an adequate sediment holding capacity



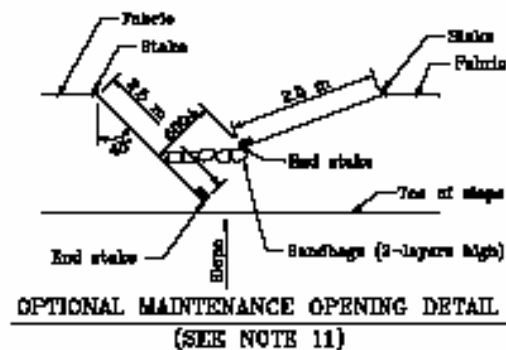
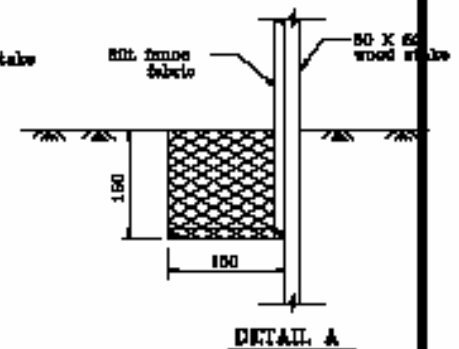
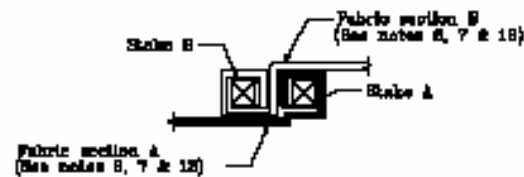
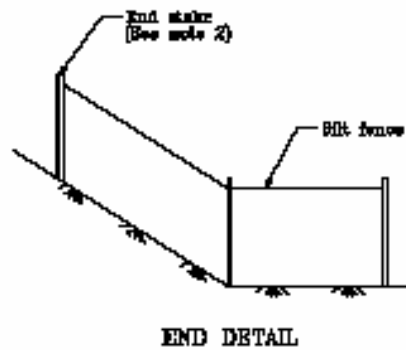
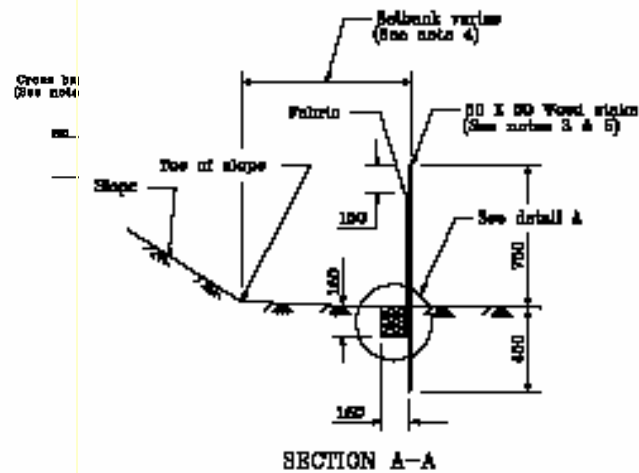
# BMP Installation - Sediment Controls

## SC-1 Silt Fence



California Storm Water Quality Handbook  
Construction Site Best Management Practices Manual  
March 1, 2003

Section 4  
Silt Fence SC-1  
5 of 6



# BMP Installation - Sediment Controls



# BMP Installation - Sediment Controls



Lack of sediment control



# BMP Installation - Sediment Controls

## SC-3 Sediment Trap



### Requirements

- Size limited by availability of right-of-way
- Not appropriate for drainage areas greater than 5 acres
  - If captured runoff has not completely infiltrated within 72 hours dewater trap
- Fencing, in accordance with Standard Spec Section 80- "Fencing", shall be provided to prevent unauthorized entry

Sediment Trap without required fencing

# BMP Installation - Sediment Controls

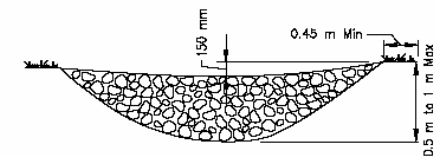
## SC-4 Check Dams



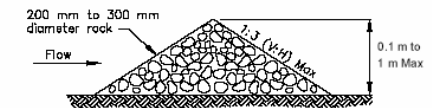
### Caltrans Requirements

- Don't use in live streams
- Not to be constructed from straw bales or a silt fence
- High flows (typically a 2-year storm or larger) shall safely flow over check dam without upstream flooding or damage to check dam
- Backwater from downstream check dam shall reach toe of upstream dam

### Check Dams

**SC-4**


ELEVATION



TYPICAL ROCK CHECK DAM SECTION

ROCK CHECK DAM  
NOT TO SCALE

# BMP Installation - Sediment Controls

## SC-5 Fiber Rolls



### Caltrans Requirements

- Use along the top, face, and at grade breaks of exposed and erodible slopes
- Use along the perimeter of a project
- Locate on level contours
- Use around temporary stockpiles

Incorrect installation of fiber rolls; too far apart,  
not trenched in

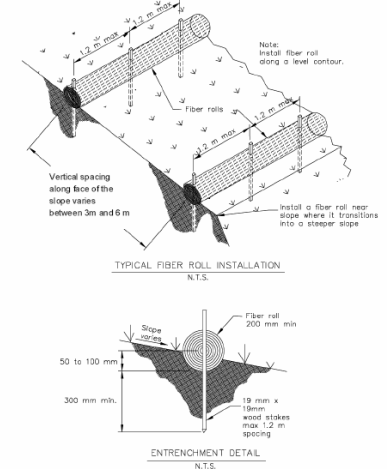
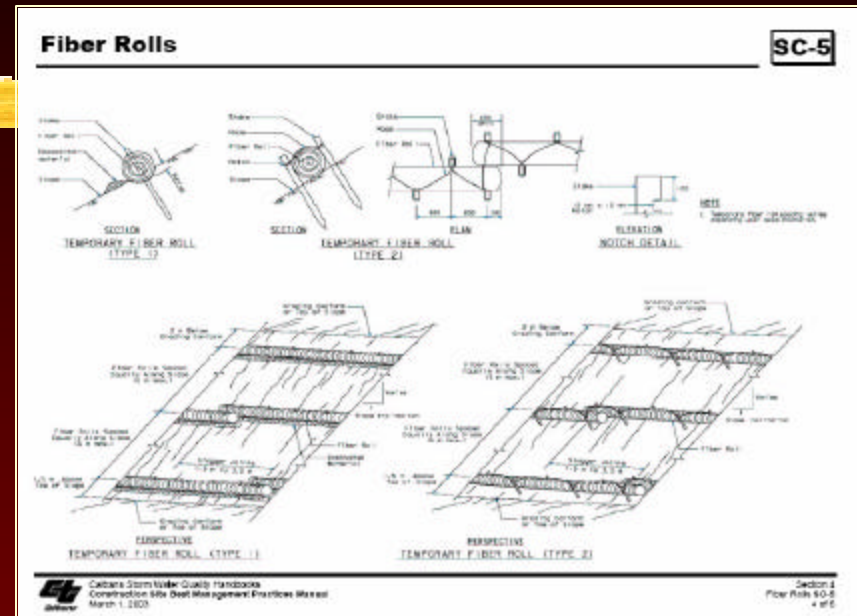


# BMP Installation - Sediment Controls

## SC-5 Fiber Rolls



Correct installation of fiber rolls



# BMP Installation - Sediment Control

## SC-7 Street Sweeping and Vacuuming



Street sweeping and vacuuming

### Caltrans Requirements

- Do not use kick brooms or sweeper attachments
- Visible sediment tracking shall be swept and vacuumed daily
- Dispose of sweeper waste at an approved dumpsite



# BMP Installation - Sediment Controls

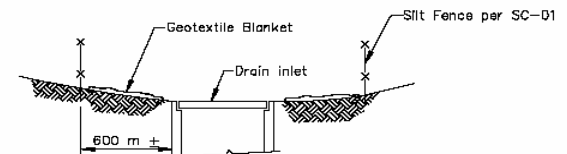
## SC-10 Storm Drain Inlet Protection



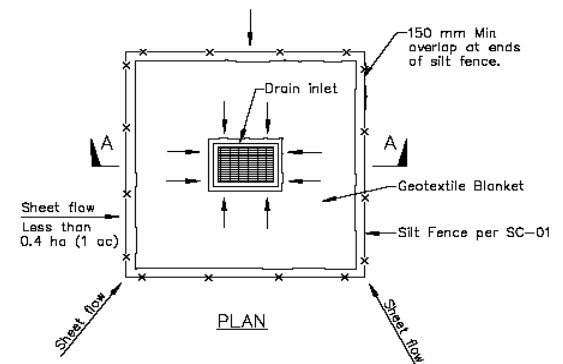
### Caltrans Requirements

- Use where ponding will not encroach into highway traffic
- For use in areas where grading is complete
- Not for concentrated flows

### Storm Drain Inlet Protection

**SC-10**


SECTION A-A



DI PROTECTION TYPE 1  
NOT TO SCALE

#### NOTES:

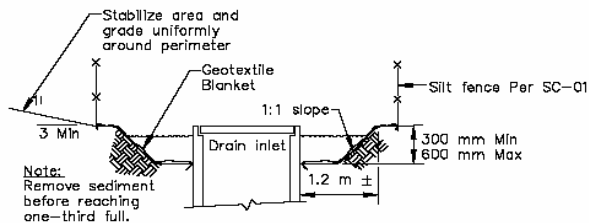
1. For use in areas where grading has been completed and final soil stabilization and seeding are pending.
2. Not applicable in paved areas.
3. Not applicable with concentrated flows.



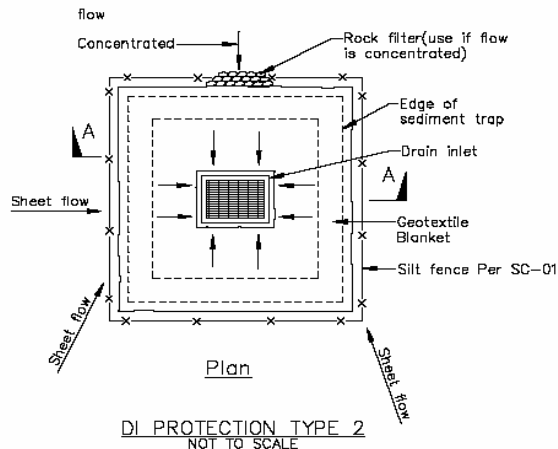
# BMP Installation - Sediment Controls

## SC-10 Storm Drain Inlet Protection

### Storm Drain Inlet Protection

**SC-10**


Section A-A



#### Notes

1. For use in cleared and grubbed and in graded areas.
2. Shape basin so that longest inflow area faces longest length of trap.
3. For concentrated flows, shape basin in 2:1 ratio with length oriented towards direction of flow.



### Caltrans Requirements

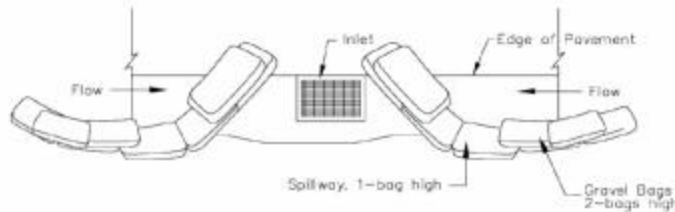
- Use where ponding will not encroach into highway traffic
- For use in cleared / grubbed and graded areas
- Frequent maintenance is required

# BMP Installation - Sediment Controls

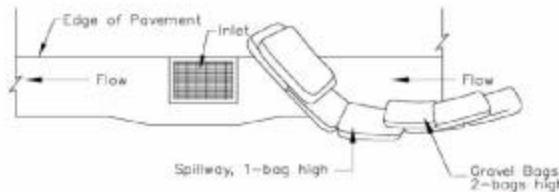
## SC-10 Storm Drain Inlet Protection

### Storm Drain Inlet Protection

**SC-10**



TYPICAL PROTECTION FOR INLET WITH OPPOSING FLOW DIRECTIONS



TYPICAL PROTECTION FOR INLET WITH SINGLE FLOW DIRECTION

**NOTES:**

1. Intended for short-term use.
2. Use to inhibit non-storm water flow.
3. Allow for proper maintenance and cleanup.
4. Bags must be removed after adjacent operation is completed.
5. Not applicable in areas with high silts and clays without filter fabric.

### Caltrans Requirements

- Use where ponding will not encroach into highway traffic
- Gravel bags shall be used
- Remove when adjacent operation is complete

# Wind Erosion Control

**ID**

WE-1

**BMP Name**

Wind Erosion Control



## BMP Installation - Wind Erosion Control WE-1

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Lack of wind erosion controls



# BMP Installation - Wind Erosion Control WE-1



Soil binder applied via water truck

## Caltrans Requirements

- Effectiveness depends on soil, temperature, humidity and wind velocity
- Temporary soil stabilizers and soil binders will also provide wind erosion control benefits

# Tracking Control



ID	BMP Name
TC-1	Stabilized Construction Entrance/Exit
TC-2	Stabilized Construction Roadway
TC-3	Entrance/Outlet Tire Wash

# BMP Installation - Tracking Control

## TC-1 Stabilized Construction Entrance / Exit

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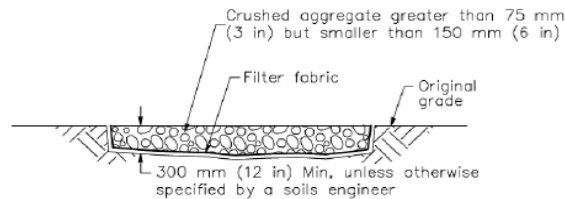
Lack of stabilized entrance / exit



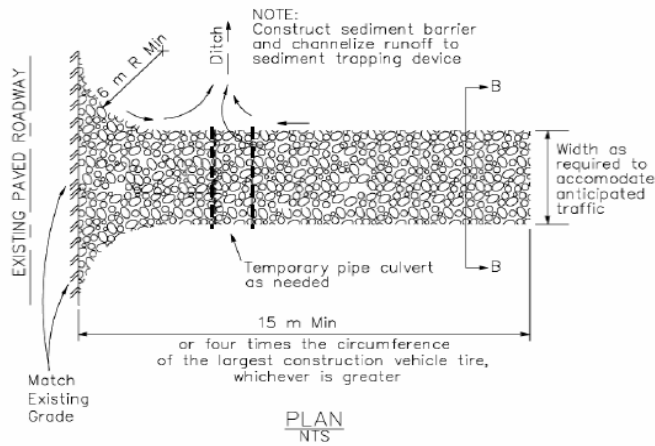
# BMP Installation - Tracking Control

## TC-1 Stabilized Construction Entrance / Exit

### Stabilized Construction Entrance/Exit

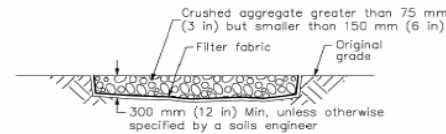
**TC-1**


SECTION B-B  
NTS

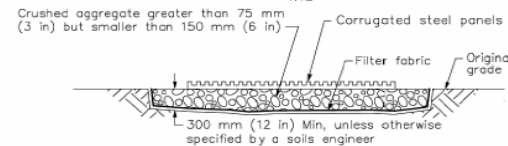


Stabilized Construction Entrance/Exit (Type 1)

### Stabilized Construction Entrance/Exit

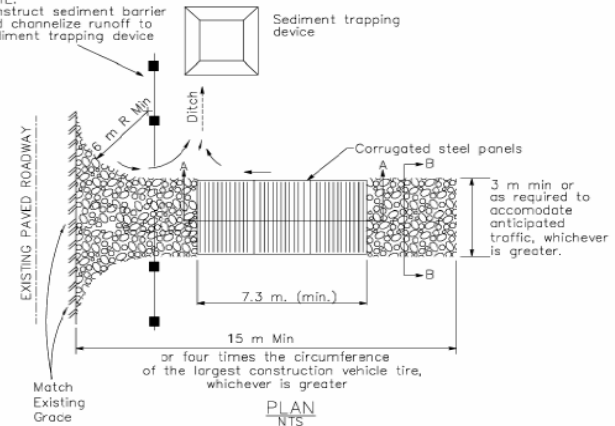
**TC-1**


SECTION B-B  
NTS



SECTION A-A  
NOT TO SCALE

NOTE: Construct sediment barrier and channelize runoff to sediment trapping device



Stabilized Construction Entrance/Exit (Type 2)

# BMP Installation - Tracking Control

## TC-1 Stabilized Construction Entrance / Exit



Large diameter rock used as a stabilized entrance / exit.

### Caltrans Requirements


- If aggregate is used place over geotextile fabric 12" deep or a depth recommended by the RE
- Use 3"-6" diameter rock
- Minimum of 50 ft (15 m) in length
  - Design for heaviest equipment
- Limit number of entrances and exits
  - Require their use

# Non-Storm Water Management BMPs



<b>ID</b>	<b>BMP Name</b>
NS-1	Water Conservation Practices
NS-2	Dewatering Operations
NS-3	Paving and Grinding Operations
NS-4	Temporary Stream Crossing
NS-5	Clear Water Diversion
NS-6	Illicit Connection / Illegal Discharge Detection and Reporting
NS-7	Potable Water / Irrigation

# Non-Storm Water Management BMPs



<b>ID</b>	<b>BMP Name</b>
NS-8	Vehicle and Equipment Cleaning
NS-9	Vehicle and Equipment Fueling
NS-10	Vehicle and Equipment Maintenance
NS-11	Pile Driving Operations
NS-12	Concrete Curing
NS-13	Material and Equipment Use Over Water
NS-14	Concrete Finishing
NS-15	Structure Demolition/Removal Over or Adjacent to Water

# BMP Installation - Non-Storm Water

## NS-2 Dewatering Operations



### Caltrans Requirements

- Notify District Construction Storm Water Coordinator
- Use Caltrans' Field Guide to Construction Site Dewatering
  - Use where groundwater or accumulated precipitation will be discharged from site
  - Addresses sediment only
  - Notify RE if pollutant other than sediment is present
- Must comply with applicable permits



# BMP Installation - Non-Storm Water NS-3 Paving and Grinding Operations



## Caltrans Requirements

- Place plastic materials under paving equipment when not in use
- Substances used to coat asphalt equipment shall not contain soap, will be non-foaming and non-toxic
- Clean equipment off-site whenever possible

# BMP Installation – Non-Storm Water NS-4 Temporary Stream Crossing

## Caltrans Requirements

- Use where construction equipment must frequently cross a waterway
- If improperly designed they may increase pollution load through washouts and scouring
- Appropriate permits are required per NS-4





# BMP Installation – Non-Storm Water NS-5 Clear Water Diversion



## Caltrans Requirements

- May require RWQCB, USACE, DFG permits / approval
- If improperly designed they may increase pollution load through flooding and washouts
- If needed follow Caltrans' Field Guide to Construction Site Dewatering
- Construct diversions with material free of potential pollutants

# BMP Installation – Non-Storm Water

## NS-6 Illicit Connection / Illegal Discharge

### Caltrans Requirements

- Can be in liquid or solid form
  - Refers to discharges and dumping caused by parties other than contractor
- Inspect site before beginning of job
- Proceed with caution – notify RE, and CSWC at time of discovery





# BMP Installation - Non-Storm Water

## NS-9 Vehicle and Equipment Fueling



### Caltrans Requirements

- Fuel on site only when impractical to go off site
- Use a designated area
- Clean up materials and spill kits available
- Protect fueling area from run-on and run-off

Mobile fueling operations require BMPs

# Waste Management and Material Pollution Control BMPs



<b>ID</b>	<b>BMP Name</b>
WM-1	Material Delivery and Storage
WM-2	Material Use
WM-3	Stockpile Management
WM-4	Spill Prevention and Control
WM-5	Solid Waste Management
WM-6	Hazardous Waste Management
WM-7	Contaminated Soil Management
WM-8	Concrete Waste Management
WM-9	Sanitary / Septic Waste Management
WM-10	Liquid Waste Management

# BMP Installation - Waste Management

## WM-1 Material Delivery and Storage



Well maintained  
temporary  
containment  
facility



Substances that  
require storage in  
a containment  
facility



### Caltrans Requirements

- Facility shall provide for a spill containment volume able to contain precipitation from a 24-hour, 25-year storm, plus 10% of the aggregate volume of all containers or 100% of the capacity of the largest container whichever is greater
- Facility shall be impervious to the materials for 72 hours



# BMP Installation - Waste Management

## WM-1 Material Delivery and Storage



### Caltrans Requirements

- Liquids, petroleum products, and substances listed in 40 CFR Parts 110, 117, and 302 require containment
- During rainy season provide permanent cover and side wind protection

Temporary containment facility for fuel

# BMP Installation - Waste Management

## WM-3 Stockpile Management



### Caltrans Requirements

- Year-round requirement
- Locate a minimum of 50ft (15m) away from concentrated flows of storm water, drainage courses, and inlets
- Protect from run-on with a perimeter sediment barrier



# BMP Installation – Waste Management

## WM-5 Solid Waste Management

### Caltrans Requirements

- Solid waste includes litter generated by the public
- Dumpsters of sufficient size and number shall be provided
- Segregate potentially hazardous waste from non-hazardous waste
- Remove from site on a biweekly basis or as directed by the RE



# BMP Installation - Waste Management

## WM-8 Concrete Waste Management



Controlled concrete  
washout



Uncontrolled concrete  
washouts



# BMP Installation - Waste Management

## WM-8 Concrete Waste Management



**Below Grade  
concrete washout**



**Above Grade concrete  
washout**

### Caltrans Requirements

- PCC and AC waste shall not be allowed to enter storm drains and watercourses
- Line all washouts with 10-mil polyethylene sheeting
- Install signs designating temporary washout areas
- Locate washout facilities a minimum of 15m (50ft) from storm drains, open drainage facilities, and water courses

# BMP Installation - Waste Management

## WM-9 Sanitary / Septic Waste Management



### Caltrans Requirements

- Locate sanitary facilities away from storm drains, water courses
- Secure if subject to high wind
- Contractor to monitor weekly

Locate temporary sanitary facilities  
away from drainage facilities

# Maintenance of BMPs



Maintenance of BMPs is a critical requirement for an effective water pollution control program



# Maintenance of BMPs

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Silt fence maintenance



# Water Quality Sampling and Analysis



## ● First things first

- Caltrans personnel will not be collecting any samples – this is the responsibility of the contractor or their lab
- Sampling and Analysis requirements apply only to SWPPP projects

# Water Quality Sampling and Analysis

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- Resolution 2001-046
  - San Francisco Bay Keepers lawsuit
  - Modification to California's General Construction Permit Monitoring and Reporting Section
  - Requires that permittees implement specific sampling and analytical procedures
  - Determine whether BMPs implemented on construction site are
    - Preventing further impairment of water bodies by sediment
    - Preventing other pollutants from causing or contributing to exceedances of water quality objectives

# Water Quality Sampling and Analysis

- What are these new Sampling and Analysis requirements intended to do?
  - The new requirements are intended to determine if BMPs implemented on the construction site are effective for preventing sediment/silt and other non-visible pollutants from impacting water quality objectives



# Water Quality Sampling and Analysis

## Pollutants Requiring Sampling

### Sediment



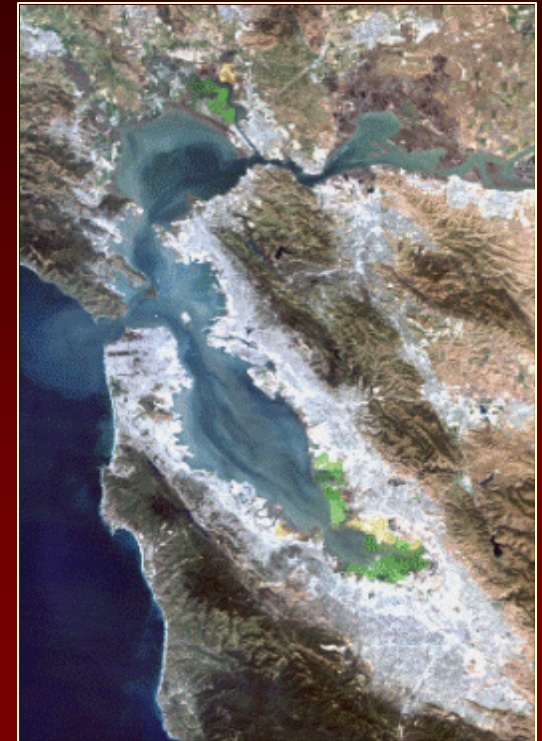
### Non-Visible





# Water Quality Sampling and Analysis

- 303(d) listed Water Bodies
  - 134 of the 685 water bodies are listed as impaired for sediment / siltation and turbidity (based on the 2002 303(d) list)



# Water Quality Sampling and Analysis

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What is....

➤ Sediment

- Soil particles that have been dislodged from their original or placed location and deposited down gradient

➤ Siltation

- The deposition of finely divided soil and rock particles upon the bottom of streams and river beds and in reservoirs

➤ Turbidity

- Cloudiness of water quantified by the degree to which light traveling through a water column is scattered by the suspended organic and inorganic particles it contains. Measured in Nephelometric Turbidity Units (NTU)



# Water Quality Sampling and Analysis

- Sediment / silt in a water body:
  - Decreases water clarity, which causes a decrease in aquatic plant production, obscures sources of food, habitats, refuges, and nesting sites of fish
  - Fills gravel spaces in stream bottoms, smothering fish eggs and juvenile fish
  - Carries nutrients such as nitrogen and phosphorous that may cause algal blooms
  - Pesticides attach to soil particles and enter waters
  - Decreases recreational, commercial, and aesthetic values of water bodies
  - Decreases quality of drinking water

# Water Quality Sampling and Analysis

## ● Turbidity

- Turbidity in water bodies effects both aquatic and human life by increasing bacteria levels, introducing viruses, and protozoan
- Blocks light transmission and light penetration
- Reducing oxygen levels
- Affecting the food chain



# Water Quality Sampling and Analysis

## ● Non-Visible Pollutants

- They are not visually detectable in storm water discharges
  - Examples: Acids, Solvents, Lime, Gypsum, Copolymer
    - Toxic properties: Caustic, Carcinogenic, Flammable etc..



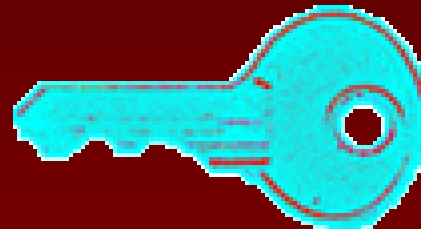
# Water Quality Sampling and Analysis

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- How do Non-Visible Pollutants effect water bodies
  - Toxic to aquatic ecosystems and humans
  - They can dissolve or remain suspended in water or get deposited on the bed
  - Deteriorates water quality
  - Pollutants can also seep down and contaminate groundwater

# Water Quality Sampling and Analysis

- **Make sure potential non-visible pollutants are:**
  - **Cleaned-up**
  - **Covered**
  - **Contained**



# Construction Period Responsibilities



- Cover as topic item in pre-Construction meeting
- Review & approve plan
- Inspections - Caltrans self enforcement
- Request, review, & approve amendments for plan deficiencies



# Construction Period Responsibilities



- Report illegal dumping
- Complete annual certificates (June 15th)
- Report non-compliance events to RE
- Complete Notice of Completion of Construction (NCC) at end of Construction

# Pre- Inspection Preparation Work

## ● Review the Plans / Contract Documents

- BMP Manual
- Standard Specifications
- Project Plans
- Special Provisions
- Storm Water Pollution Prevention / WPCP Plans
  - Water Pollution Control Drawings
  - Project Schedule
  - Other NPDES Permits
- Use SWPPP / WPCP Preparation Manual
- Project File



# Field Inspection Techniques



- **Storm Water Inspection Tips**
- **If possible take copy of approved plan on field inspection**
- **Use an inspection form – Attachment H from the SWPPP Preparation Manual**
- **Contractor should participate in inspection**
- **Inspect the entire site including the perimeter**
- **Start inspection from lowest point or from area where discharge possibility is the highest**

# Field Inspection Techniques



## ● Storm Water Inspection Tips

- Walk interior and perimeter of Contractors yard
- Offsite (off the R of W) yards require inspection, however check with RE before entry
- Invite Structures Construction personnel
- Identify existing conditions
- Take photographs
- Identify changes in construction that may require amendments to the SWPPP or WPCP

# Inspections

## ● Frequency

- Prior to anticipated storm events
- During extended storm events (once each 24-hour period)
- After actual storm events
- As specified in the Special Provisions





# Inspections

- **Prior to an anticipated storm event, confirm:**
  - **Active areas limited as specified (rainy season)**
  - **The protection of active and nonactive DSAs**
  - **The control of off-site storm water run-on**
  - **The condition of drainage systems**
  - **BMPs are properly implemented**



# Inspections

- **During a storm event:**
  - **Best time to review BMPs!**
  - **Confirm the proper functioning of BMPs**
  - **Ensure BMPs do not cause flooding or traffic hazard**
  - **Repair or revise BMPs as conditions allow**
  - **Good learning experience**



# Inspections

- **After an actual storm event:**
  - **Identify BMPs that failed**
  - **Identify BMPs that need maintenance**
  - **Repair, revise and maintain BMPs as necessary**
  - **Good learning experience**



# Notice Of Discharge

- ➔ Action required upon discovery of a discharge or if the project receives a written notice or order from any regulatory agency
- ➔ Failure to report is subject to \$32,500 fine





# Notice Of Discharge

- **Applicable Discharges:**
  - Storm water discharges that contain sediment from DSAs due to the absence of required, failed or damaged BMPs
  - Prohibited non-storm water discharges
  - Discharges that violate 404 permits or 401 certifications





# Inspection Form



Revised Storm Water Quality Inspection Checklist  
available in 2003 version of SWPPP Preparation  
Manual

[http://www.dot.ca.gov/hq/construc/stormwater/  
sw\\_attachments/attachment\\_haddendum.doc](http://www.dot.ca.gov/hq/construc/stormwater/sw_attachments/attachment_haddendum.doc)

**Special Provisions may require different form**

# Documentation

## File Organization

- **Category 20**
- **Inspections - Daily Reports**
- **Correspondence**
- **Certifications – Annual due June 15**
- **SWPPP / WPCP**
- **Amendments**
- **Photographs**
- **Notice of Completion**
- **Retain for Three Years**

